In view of the following remarks, these rejections are traversed, and reconsideration of this application is respectfully requested.

Applicant's invention is a fuel cell system that includes a fuel cell stack through which a cooling fluid flows. A heat pump module receives the heated cooling fluid from the fuel cell stack and cools the heated cooling fluid that is then returned to the stack. The heat pump module includes a compression device that compresses the heated cooling fluid from the stack to raise its temperature and pressure, a cooling device for cooling the compressed and heated cooling fluid from the compression device and an expansion device for decreasing the pressure and temperature of the compressed cooled cooling fluid from the cooling device.

Applicant submits that each and every claim element must be shown in a prior art reference for a claim to be anticipated. For the reasons given below, Applicant respectfully submits that U.S. Patent Nos. 6,605,377 and 6,584,796 and Patent Publication No. 2003/0157386 do not anticipate independent claims 1, 7 and 13.

U.S. Patent No. 6,605,377 issued to Kimbara et al. discloses a cooling apparatus 3 for a fuel cell system. The cooling apparatus 3 includes a chemical heat pump HP1 that chemically cools isopropryl alcohol (IPA) that is used to control the temperature of a fuel cell 1. A discussion of how the chemical heat pump HP1 provides the chemical reaction to do this can be found at column 3, lines 60 – column 4, line 20. A pump 22 pumps the IPA through the fuel cell 1, through the heat pump HP1 and through a radiator 26. The IPA flows through a high temperature heat exchanger 25 and a low temperature heat exchanger 23 and is condensed by a condenser 27 to a liquid state that is collected by a tank 20. The liquid IPA is then pumped from the tank 20 by the pump 22. A bypass line 21A allows hydrogen gas in the tank 20 to be pumped by a compressor CP1 into the heat exchanger HP1.

Applicant submits that a careful review of the Kimbara '377 heat exchanger HP1 shows that it does not include a compression device that compresses a heated cooling fluid from a fuel cell stack, a cooling device that cools the heated and compressed cooing fluid from the compression device, and an expansion device that decreases the pressure and temperature of the cooled and compressed cooling fluid. The radiator 15 is not included in the heat pump HP1 (column 3, line 49). The compressor CP1 is used to pump hydrogen gas out of the tank 20. The compressor CP1 does not receive the heated cooling fluid from the fuel cell 1 and is not in the heat pump HP1. Further, the heat pump HP1 does not include an expansion device. The expansion device in column 13, lines 22-28 is a scroll expansion device 135 that is not in the heat pump HP1, and is not in the cooling fluid loop of the fuel cell 1. Therefore, Applicant submits that Kimbara '377 cannot anticipate Applicant's independent claims.

U.S. Patent No. 6,584,796 issued to Itoh et al. discloses a heat pump 100 that provides air conditioning for the passenger compartment of a vehicle. The vehicle includes a fuel cell 200 that has a cooling fluid loop that directs the cooling fluid through a heater core 210. The heater core 210 heats air forced into the passenger compartment of the vehicle through casing 300 by using the heated cooling fluid used to cool the fuel cell stack 200 (column 5, lines 2-4). The heat pump 100 is not in the cooling fluid loop of the fuel cell stack 200, and does not include a compression device, a cooling device and an expansion device in the order as claimed.

A switching valve V controls the flow of refrigerant through the heat pump 100. An electric compressor 110 compresses the refrigerant from an accumulator 140 that flows through an internal heat exchanger 150, to an outdoor heat exchanger 130, to a pressure reducing unit 162, back to the internal heat exchanger 150, to a pressure reducing unit 161, then to an indoor heat exchanger 120 and then back to the accumulator 140.

Alternately, the switching valve V causes the refrigerant to first flow to the indoor heat exchanger 120 in an opposite flow direction. Therefore, Applicant submits that Itoh et al. cannot anticipate independent claims 1, 7 and 13.

Gottmann et al. discloses a power generation system that includes a heat pump that receives high temperature heat from a fuel cell stack to cool a data center. Paragraphs [0076] and [0077] discuss the type of heat pumps that are applicable. The compression device in paragraph [0083] is a blower 18 that provides air to a fuel cell 68, and is not associated with the heat pump. Paragraph [0122] does not discuss the blower 18 reducing the temperature of a compressed cooling fluid. Paragraphs [0181] – [0187] refer to a felt seal shown in figure 28, and have nothing to do with a heat pump, an expansion device, or anything else that is relevant. Therefore, Applicant respectfully submits that Gottmann et al. cannot anticipate independent claims 1, 7 and 13.

U.S. Patent No. 6,802,875 issued to Kimbara et al. discloses a fuel cell system that includes a hydride bed. However, Kimbara '875 does not teach or suggest using the hydride bed in association with a heat pump that includes a compression device, a cooling device and an expansion device that are used to reduce the temperature of a cooling fluid that flows through a fuel cell stack, and therefore fails to provide the teaching missing from Kimbara '377 to make Applicant's claimed invention obvious.

In view of the preceding remarks, it is respectfully requested that the §102 and §103 rejections be withdrawn.

It is now believed that this application is in condition for allowance. If the Examiner believes that personal contact with Applicant's representative would expedite prosecution of this application, she is invited to call the undersigned at her convenience.

Respectfully submitted,

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Dated: 1/30/06